pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

**Northwest Regional Office**
**CLEAN WATER PROGRAM**

# NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

| | | | |
|---|---|---|---|
| Application Type | **Renewal** | Application No. | **PA0028428** |
| Facility Type | **Municipal** | APS ID | **932282** |
| Major / Minor | **Major** | Authorization ID | **1167573** |

## Applicant and Facility Information

| | | | |
|---|---|---|---|
| Applicant Name | **Brockway Area Sewer Authority** | Facility Name | **Brockway Area WWTP** |
| Applicant Address | 501 Main Street | Facility Address | 70 Industrial Park Road |
| | Brockway, PA 15824 | | Brockway, PA 15824 |
| Applicant Contact | Laurie Wayne, Manager | Facility Contact | Rick Boleen, Operator |
| Applicant Phone | (814) 268-6565 | Facility Phone | (814) 265-0830 |
| Client ID | 202231 | Site ID | 263008 |
| Ch 94 Load Status | Not Overloaded | Municipality | Brockway Borough |
| Connection Status | No Limitations | County | Jefferson |
| Date Application Received | January 24, 2017 | EPA Waived? | No |
| Date Application Accepted | February,6, 2017 | If No, Reason | Major Facility |

Purpose of Application: Major NPDES permit renewal

## Summary of Review

Supporting documents:

Brockway Area SA DO modelng.p...
Brockway Area SA toxics modell...
Brockway Area SA Toxics Screen...
Brockway Toxics Explanation1.d...
Brockway Area SA DMR Summary.x...
Brockway Area SA EPA Checklist...

| Approve | Deny | Signatures | Date |
|---|---|---|---|
| X | | ROBERT P. HUTCHINSON, PERMITS SECTION — DRAFT / FINAL | |
| X | | JUSTIN C. DICKEY, P.E., ENVIRONMENTAL ENGINEER MANAGER — DRAFT / FINAL | |
| X | | JOHN A. HOLDEN, P.E., REGIONAL PROGRAM MANAGER | |

## Discharge, Receiving Waters and Water Supply Information

| | | | |
|---|---|---|---|
| Outfall No. | 001 | Design Flow (MGD) | 1.5 |
| Latitude | 41º 15' 08" | Longitude | -78º 47' 53" |
| Quad Name | Falls Creek | Quad Code | 04081 |
| Wastewater Description: | Treated domestic sewage, industrial wastewater and oil and gas brine wastewater (except from shale gas extraction activities) | | |
| Receiving Waters | Little Toby Creek | Stream Code | 49666 |
| NHD Com ID | 134396185 | RMI | 10.62 mi |
| Drainage Area | 90.2 $mi^2$ | Yield ($cfs/mi^2$) | 0.102 |
| $Q_{7-10}$ Flow (cfs) | 9.2 | $Q_{7-10}$ Basis | W. Br. Clarion R @ Wilcox gage |
| Elevation (ft) | 1430 | Slope (ft/ft) | 0.00209 |
| Watershed No. | 17-A | Chapter 93 Class. | CWF |
| Existing Use | | Existing Use Qualifier | |
| Exceptions to Use | None | Exceptions to Criteria | None |
| Assessment Status | Impaired | | |
| Cause(s) of Impairment | Metals, Suspended Solids, pH | | |
| Source(s) of Impairment | Abandoned Mine Drainage | | |
| TMDL Status | Final | Name | Little Toby Creek |

| Background/Ambient Data | | Data Source |
|---|---|---|
| pH (SU) | 5.21 | Mean value from the 6/09 L. Toby Ck TMDL report |
| Temperature (°C) | 20 | Default temp for a CWF stream |
| Hardness (mg/L) | 136 | Applicant measured value reported in the NPDES app. |
| $CBOD_5$ (mg/L) | 2 | Default value |
| $NH_3$-N (mg/L) | 0.1 | Default value |

| | | | |
|---|---|---|---|
| Nearest Downstream Public Water Supply Intake | | PA American Water Co. | |
| PWS Waters | Clarion River | Flow at Intake (cfs) | 195.14 |
| PWS RMI | 33.6 mi | Distance from Outfall | approx. 66 mi |

Changes Since Last Permit Issuance: None

| Treatment Facility Summary | | | | |
|---|---|---|---|---|
| **Treatment Facility Name:** Brockway Area WWTP | | | | |
| **WQM Permit No.** | **Issuance Date** | | | |
| 3303403 | 5/6/04 | | | |
| **Waste Type** | **Degree of Treatment** | **Process Type** | **Disinfection** | **Avg Annual Flow (MGD)** |
| Sewage | Secondary w/ Ammonia Reduction | Oxidation Ditch | Ultraviolet | --- |
| | | | | |
| **Hydraulic Capacity (MGD)** | **Organic Capacity (lbs/day)** | **Load Status** | **Biosolids Treatment** | **Biosolids Use/Disposal** |
| 1.5 | 2502 | Not Overloaded | Aerobic Digestion | Land Application |

Changes Since Last Permit Issuance: None

**WQM #3303403**: Influent Pump Station, Screening, Bypass Bar Screen (manual), (2) Aerated Stormwater Storage Basins, (2) Oxidation Ditches, (2) Spiroflo Final Clarifiers, Ultraviolet Disinfection, Post-Aeration, an Aerobic Digester and a Belt Filter Press. The collection system for the service area was also constructed under this permit.

A 6/20/14 request was made to remove the plant's existing, manually operated trash basket screening assembly and replace it with an automatically controlled, powered mechanical screen. This was considered a minot WQM amendment and was therefore approved via e-mail on 7/14/14.

**WQM #3316402** [issued 4/10/17]: Collection system improvements and a sewer service extension consisting of:

- North 219 vacuum pump station upgrade
- New, Circle Drive pump station
- Bond Street sewer replacement
- Keystone Road sewer extension

## Development of Effluent Limitations

**Outfall No.** 001 **Design Flow (MGD)** 1.5
**Latitude** 41º 15' 08" **Longitude** -78º 47' 53"
**Wastewater Description:** Treated domestic sewage, industrial wastewater and oil and gas brine wastewater (except from shale gas extraction activities)

### Technology-Based Limitations

The following technology-based limitations apply, subject to water quality analysis and BPJ where applicable:

| Pollutant | Limit (mg/l) | SBC | Federal Regulation | State Regulation |
|---|---|---|---|---|
| $CBOD_5$ | 25 | Average Monthly | 133.102(a)(4)(i) | 92a.47(a)(1) |
| | 40 | Average Weekly | 133.102(a)(4)(ii) | 92a.47(a)(2) |
| Total Suspended Solids | 30 | Average Monthly | 133.102(b)(1) | 92a.47(a)(1) |
| | 45 | Average Weekly | 133.102(b)(2) | 92a.47(a)(2) |
| pH | 6.0 – 9.0 S.U. | Min – Max | 133.102(c) | 95.2(1) |
| Fecal Coliform (5/1 – 9/30) | 200 / 100 ml | Geo Mean | - | 92a.47(a)(4) |
| Fecal Coliform (5/1 – 9/30) | 1,000 / 100 ml | IMAX | - | 92a.47(a)(4) |
| Fecal Coliform (10/1 – 4/30) | 2,000 / 100 ml | Geo Mean | - | 92a.47(a)(5) |
| Fecal Coliform (10/1 – 4/30) | 10,000 / 100 ml | IMAX | - | 92a.47(a)(5) |
| Total Residual Chlorine | 0.5 | Average Monthly | - | 92a.48(b)(2) |

Comments: The facility employs UV disinfection instead of chlorine.

### Water Quality-Based Limitations

A "Reasonable Potential Analysis" determined the following parameters require water quality based limits (modeling output files attached):

| Parameter | Limit (mg/l) | SBC | Model |
|---|---|---|---|
| $NH_3$-N (5/1-10/31) | 16 | Average Monthly | WQM 7.0 D.O./$NH_3$-N toxicity model |
| Selenium | 0.025 | Average Monthly | PENTOXSD toxics model |
| Chronic WET – c. dubia (survival & reproduction) | 5.0 TUc | Daily Maximum | WET Testing Evaluation |

### Best Professional Judgment (BPJ) Limitations

| Parameter | Limit (mg/l) | SBC | Basis |
|---|---|---|---|
| $NH_3$-N (5/1-10/31) | 6.5 | Average Monthly | Previous permit's limit being retained |
| $NH_3$-N (11/1-4/30) | 19.5 | Average Monthly | Previous permit's limit being retained |
| TDS | 13,149 lb/day | Average Monthly | Grandfathered Amount - Chap 95.10(a) |
| TDS | 28,683 lb/day | Daily Max | Grandfathered Amount - Chap 95.10(a) |
| Dissolved Oxygen | 4.0 | Min | SOP |
| Total Nitrogen | Monitor & Report | Average Monthly | SOP |
| Total Phosphorus | Monitor & Report | Average Monthly | SOP |
| UV light intensity | Monitor & Report ($\mu w/cm^2$) | Average Monthly | SOP |
| BOD5 influent | Monitor & Report (conc. & mass) | Average Monthly | SOP |
| TSS influent | Monitor & Report (conc. & mass) | Average Monthly | SOP |

## Whole Effluent Toxicity (WET)

For Outfall 001, ☐ **Acute** ☒ **Chronic** WET Testing was completed:

☒ For the permit renewal application (4 tests).
☐ Quarterly throughout the permit term.
☐ Quarterly throughout the permit term and a TIE/TRE was conducted.
☐ Other:

The dilution series used for the tests was: 100%, 56.6%, 32%, 16%, and 10%. The Target Instream Waste Concentration (TIWC) to be used for analysis of the results is: 18%.

**Summary of Four Most Recent Test Results**

*(NOTE – Enter results into one table, depending on which data analysis method was used).*

NOEC/LC50 Data Analysis

| | ***Ceriodaphnia* Results (% Effluent)** | | | ***Pimephales* Results (% Effluent)** | | | |
|---|---|---|---|---|---|---|---|
| **Test Date** | **NOEC Survival** | **NOEC Reproduction** | **LC50** | **NOEC Survival** | **NOEC Growth** | **LC50** | **Pass? *** |
| 2/2-9/16 | 100% | 56.6% | --- | 100% | 100% | --- | Y |
| 5/3-10/16 | 100% | 56.6% | --- | 100% | 100% | --- | Y |
| 7/31-8/5/16 | 56.6% | <10% | --- | 100% | 100% | --- | N |
| 11/1-8/16 | 100% | 32% | --- | 100% | 100% | --- | Y |

***** *A "passing" result is that which is greater than or equal to the TIWC value.*

Is there reasonable potential for an excursion above water quality standards based on the results of these tests? (*NOTE – In general, reasonable potential is determined anytime there is at least one test failure in the previous four tests).*

☒ **YES** ☐ **NO**

**Evaluation of Test Type, IWC and Dilution Series for Renewed Permit**

Acute Partial Mix Factor (PMFa): **0.45** Chronic Partial Mix Factor (PMFc): **1**

1. **Determine IWC – Acute (IWCa)**:

   $(Q_d \times 1.547) / ((Q_{7\text{-}10} \times PMFa) + (Q_d \times 1.547))$

   [(1.5 MGD x 1.547) / ((9.2 cfs x 0.45) + (1.5 MGD x 1.547))] x 100 = **36%**

   Is IWCa < 1%? ☐ **YES** ☒ **NO (YES - Acute Tests Required OR NO - Chronic Tests Required)**

   **Type of Test for Permit Renewal**: **Chronic**

2. **Determine Target IWCc (If Chronic Tests Required)**

   $(Q_d \times 1.547) / (Q_{7\text{-}10} \times PMFc) + (Q_d \times 1.547)$

   **TIWCc** = [(1.5 MGD x 1.547) / ((9.2 cfs x 1) + (1.5 MGD x 1.547))] x 100 = **20%**

3. **Determine Dilution Series**

   *(NOTE – check Attachment C of WET SOP for dilution series based on TIWCa or TIWCc, whichever applies).*

   Dilution Series = **100%, 60%, 20%, 10%, and 5%.**

**WET Limits**

Has reasonable potential been determined? ☒ YES ☐ NO

Will WET limits be established in the permit? ☒ YES ☐ NO

If WET limits will be established, identify the species and the limit values for the permit (TU).

***Ceriodaphnia – TUc = 5 [= 1/TIWCc]***

## Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (362-0400-001), SOPs and/or BPJ.

**Outfall 001, Effective Period: Permit Effective Date through Permit Expiration Date**.

| Parameter | Effluent Limitations | | | | | | Monitoring Requirements | |
|---|---|---|---|---|---|---|---|---|
| | Mass Units (lbs/day) (1) | | Concentrations (mg/L) | | | | Minimum (2) Measurement Frequency | Required Sample Type |
| | Average Monthly | Weekly Average | Minimum | Average Monthly | Weekly Average | Instant. Maximum | | |
| Flow (MGD) | Report | Report Daily Max | XXX | XXX | XXX | XXX | Continuous | Measured |
| pH (S.U.) | XXX | XXX | 6.0 | XXX | 9.0 Max | XXX | 1/day | Grab |
| DO | XXX | XXX | 4.0 Inst Min | XXX | XXX | XXX | 1/day | Grab |
| CBOD5 | 250 | 375 | XXX | 20 | 30 | 40 | 2/week | 24-Hr Composite |
| BOD5 Raw Sewage Influent | Report | XXX | XXX | Report | XXX | XXX | 2/week | 24-Hr Composite |
| TSS Raw Sewage Influent | Report | XXX | XXX | Report | XXX | XXX | 2/week | 24-Hr Composite |
| TSS | 375 | 562 | XXX | 30 | 45 | 60 | 2/week | 24-Hr Composite |
| Total Dissolved Solids | 17574 | 29143 Daily Max | XXX | 4274 | XXX | 7960 | 2/month | 24-Hr Composite |
| Osmotic Pressure (mOs/kg) | XXX | XXX | XXX | Report | XXX | XXX | 2/month | 24-Hr Composite |
| Fecal Coliform (No./100 ml) Oct 1 - Apr 30 | XXX | XXX | XXX | 2000 Geo Mean | XXX | 10000 | 2/week | Grab |
| Fecal Coliform (No./100 ml) May 1 - Sep 30 | XXX | XXX | XXX | 200 Geo Mean | XXX | 1000 | 2/week | Grab |
| UV Intensity (µw/cm²) | XXX | XXX | XXX | Report | XXX | XXX | 1/day | Measured |
| Total Nitrogen | XXX | XXX | XXX | Report | XXX | XXX | 2/week | 24-Hr Composite |

**Outfall 001, Continued (from Permit Effective Date through Permit Expiration Date)**

| Parameter | Effluent Limitations | | | | | | Monitoring Requirements | |
|---|---|---|---|---|---|---|---|---|
| | Mass Units (lbs/day) (1) | | Concentrations (mg/L) | | | | Minimum (2) Measurement Frequency | Required Sample Type |
| | Average Monthly | Weekly Average | Minimum | Average Monthly | Weekly Average | Instant. Maximum | | |
| Ammonia<br>Nov 1 - Apr 30 | 243 | XXX | XXX | 19.5 | XXX | 39 | 2/week | 24-Hr Composite |
| Ammonia<br>May 1 - Oct 31 | 81 | XXX | XXX | 6.5 | XXX | 13 | 2/week | 24-Hr Composite |
| Total Phosphorus | XXX | XXX | XXX | Report | XXX | XXX | 2/week | 24-Hr Composite |
| Total Barium | XXX | XXX | XXX | Report | XXX | XXX | 2/month | 24-Hr Composite |
| Total Strontium | XXX | XXX | XXX | Report<br>Avg Qrtly | XXX | XXX | 1/quarter | 24-Hr Composite |
| Total Uranium (µg/L) | XXX | XXX | XXX | Report<br>Avg Qrtly | XXX | XXX | 1/quarter | 24-Hr Composite |
| Chloride | XXX | XXX | XXX | Report<br>Avg Qrtly | XXX | XXX | 1/quarter | 24-Hr Composite |
| Bromide | XXX | XXX | XXX | Report<br>Avg Qrtly | XXX | XXX | 1/quarter | 24-Hr Composite |
| Gross Alpha (pCi/L) | XXX | XXX | XXX | Report<br>Avg Qrtly | XXX | XXX | 1/quarter | 24-Hr Composite |
| Ra-226/228, Total (pCi/L) | XXX | XXX | XXX | Report<br>Avg Qrtly | XXX | XXX | 1/quarter | 24-Hr Composite |
| Chronic WET - Ceriodaphnia Survival (TUc) | XXX | XXX | XXX | 5.0<br>Daily Max | XXX | XXX | 1/quarter | See Permit |
| Chronic WET - Ceriodaphnia Reproduction (TUc) | XXX | XXX | XXX | 5.0<br>Daily Max | XXX | XXX | 1/quarter | See Permit |
| Selenium, Total (Interim)* | Report | XXX | XXX | Report | XXX | XXX | 2/month | 24-Hr Composite |
| Selenium, Total (Final)** | 0.31 | XXX | XXX | 0.025 | XXX | 0.062 | 1/week | 24-Hr Composite |

* Interim limits apply from the permit effective date (PED) to 3 years after the PED.
** Final limits apply from 3 years after the PED to the expiration date.

Compliance Sampling Location: Outfall 001 – after disinfection

Special Conditions:

- Toxics Reduction Evaluation for Selenium
- Whole Effluent Toxicity testing with a TU limit
- Solids Handling/Reporting
- Hauled-In Waste restrictions
- Limit on the quantity of wastewater associated with natural gas drilling
- Receipt of Drilling Waste Volume restriction

Comments: The previous permit's special condition related to the development and submittal of a Radiation Protection Plan is no longer applicable since the applicant has completed this requirement. The condition's language was removed from this permit.

The $CBOD_5$ limit was adjusted to conform to the Regional practice of expressing the limits in multiples of 5 mg/l. This changes the monthly average limit from 19 mg/l to 20 mg/l. The new limit is protective of water quality since modeling shows the limit could be the secondary treatment level of 25 mg/l. To be consistent with the previous permit(s0, seasonal limits were not included for this parameter.

This permit also relaxes the monitoring frequency of the indicator pollutants associated with natural gas-related wastewater. Monitoring for these parameters will change from 2/month to 1/quarter. This is based on a review of the past 3 years of data collected on these parameters. The monitoring reduction does not include Barium and Osmotic Pressure.

| **Tools and References Used to Develop Permit** |
|---|
| |
| WQM for Windows Model (see Attachment) |
| PENTOXSD for Windows Model (see Attachment) |
| Toxics Screening Analysis Spreadsheet (see Attachment) |
| Determining Water Quality-Based Effluent Limits, 391-2000-003, 12/97. |
| Implementation Guidance Design Conditions, 391-2000-006, 9/97. |
| Technical Reference Guide (TRG) WQM 7.0 for Windows, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen, Version 1.0, 391-2000-007, 6/2004. |
| Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 391-2000-008, 10/1997. |
| Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 391-2000-011, 5/2004. |
| Implementation Guidance for Section 93.7 Ammonia Criteria, 391-2000-013, 11/97. |
| Implementation Guidance for Application of Section 93.5(e) for Potable Water Supply Protection Total Dissolved Solids, Nitrite-Nitrate, Non-Priority Pollutant Phenolics and Fluorides, 391-2000-019, 10/97. |
| Implementation Guidance for the Determination and Use of Background/Ambient Water Quality in the Determination of Wasteload Allocations and NPDES Effluent Limitations for Toxic Substances, 391-2000-022, 3/1999. |
| SOP: Establishing Effluent Limitations for Individual Sewage Permits |
| SOP: New & Reissuance Sewage Individual NPDES Permit Applications |